Active Project (2012 - 2016)

Programmable Ultra Lightweight System Adaptable Radio (PULSAR) Project

Game Changing Development Program | Space Technology Mission Directorate (STMD)

ANTICIPATED BENEFITS

To NASA funded missions:

The S-band Frequency is overcrowded and data-stream limited. The FCC is pushing many users (cubesats) out of S-band frequencies (2 to 4 Ghz) over the next two years; which includes NASA funded missions. X-band is a great frequency range for cubesats to fall back to (8 Ghz). It has fewer users (at this time) and about 20 times the data throughput. However, there are very few software defined radios (SDRs) in this frequency that a cube sat can afford from a cost or a mass perspective. Traditional radios in this frequency range cost more than most entire cubesat budgets; same for mass. PULSAR has been working to meet this anticipated need for 3 years. Once Pulsar completes the Near-Earth- Network certification, it will be available to any U.S. Government user at a cost of less than 100k$ and mass values less than 2.5 kgs. The throughput will exceed 110 Mbits per second. Additional benefits to NASA funded missions (only) are the large FPGA (Field Programmable Gate Arrays) arrays available “on board” the PULSAR. There is significant “real estate” left inside the PULSAR for it to be programmed as a flight computer, a data pre-processor and/or an encryption processor. This type of effort would require an additional development cycle, but has a “no additional mass or size” benefit that is, or could be, worth the investment.

DETAILED DESCRIPTION

High performance Software Defined Radio in S-/X-band

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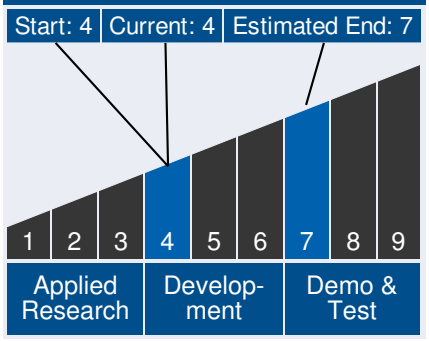
Technology Maturity



Management Team

Program Executive:

- Lanetra Tate

Program Manager:

- Mary Wusk

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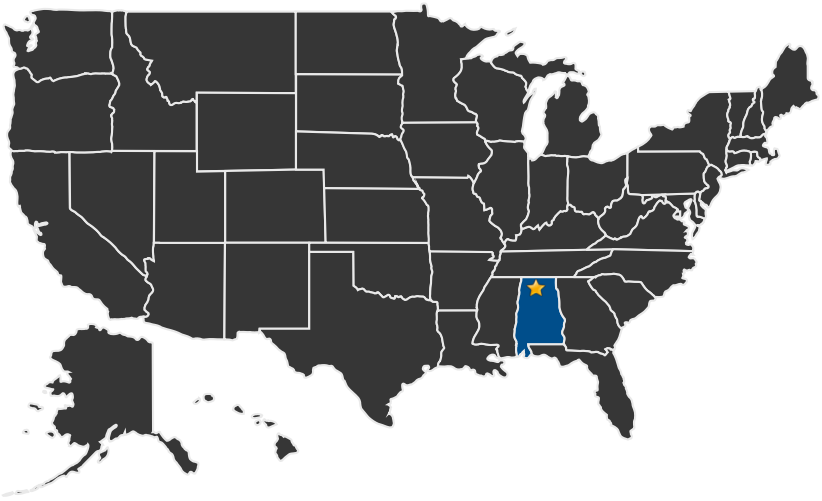
U.S. WORK LOCATIONS AND KEY PARTNERS



U.S. States With Work

Lead Center:
Marshall Space Flight Center

Other Organizations Performing Work:

- Boeing
- Cytec
- Janicki Industries
- Southern Research Institute

DETAILS FOR TECHNOLOGY 1

Management Team *(cont.)*

Project Manager:

- Anupa Bajwa

Technology Areas

Primary Technology Area:
Robotics and Autonomous Systems (TA 4)